

$$1. \frac{a^2 - b^2}{a^2 b} \cdot \frac{ab^2}{3a + 3b} = \frac{\cancel{(a+b)}(a-b)}{\cancel{a^2} b} \cdot \frac{\cancel{a} b^2}{3\cancel{(a+b)}} = \frac{b(a-b)}{3a^2}$$

$$2. \frac{4-a}{5a} \cdot \frac{a^2 + 5a}{a^2 + a - 20} = \frac{-1\cancel{(a-4)}}{5a} \cdot \frac{a\cancel{(a+5)}}{\cancel{(a+5)}(a-4)} = -\frac{1}{5}$$

$$3. \frac{a^2 + 5ab + 6b^2}{a^2 - 5ab + 6b^2} \cdot \frac{10a - 30b}{5a + 10b} = \frac{\cancel{(a+b)}(a+2b)}{\cancel{(a-b)}(a-2b)} \cdot \frac{10\cancel{(a-3b)}}{5\cancel{(a+2b)}} = \frac{2(a+3b)}{a-2b}$$

$$4. \frac{3a^2 b - ab^2}{6a} \cdot \frac{9a^2}{9a^2 - b^2} = \frac{\cancel{ab}(3a-b)}{\cancel{6}a} \cdot \frac{9a^2}{\cancel{(3a-b)}(3a+b)} = \frac{3a^2 b}{2(3a+b)}$$

$$5. \frac{2a^2 - 3a + 5}{8a^2 - 2a} \cdot \frac{6a - 4b}{a^2 - 2a + 25} = \frac{\cancel{(2a-3)}(a-5)}{4a\cancel{(2a-3)}} \cdot \frac{-2a(2a-3)}{(a-5)\cancel{(a-5)}} = -\frac{(2a-3)}{2(a-5)}$$

$$6. \frac{-a^3 + ab^2}{a^2} \cdot \frac{a^3 + 7a^2 b}{a^2 + 6ab - 7b^2} = \frac{-a(a^2 - b^2)}{a^2} \cdot \frac{a^2 \cancel{(a+7b)}}{\cancel{(a+7b)}(a-b)} = \frac{-a\cancel{(a+b)}(a-b)}{\cancel{(a-b)}} = -a(a+b)$$

$$7. \frac{6a + 14}{2a^2 + 5a - 12} \cdot \frac{4a^2 - 9}{15a^2} = \frac{\cancel{2}(a+7)}{\cancel{(2a-3)}(a+4)} \cdot \frac{\cancel{(2a+3)}(2a-3)}{\cancel{15}a^2} = \frac{2(2a+3)}{5a^2}$$

$$8. \frac{2a-10}{40-3a-a^2} \cdot \frac{a-8}{2a^2-3a} = \frac{\cancel{2}(a-5)}{-1(a+8)\cancel{(a-5)}} \cdot \frac{a-8}{2a(a-4)} = \frac{4(a-8)}{-9(a+8)(a-4)}$$

$$9. \frac{27a^2 b^7}{3a^2 - 6ab + 3b^2} \cdot \frac{(a-1)^3}{9ab^3} = \frac{\cancel{3^2} a^2 \cancel{b^7}}{\cancel{3}(a-b)^2} \cdot \frac{\cancel{(a-1)}^3}{\cancel{9} ab^3} = a^3 b^4 (a-1)$$

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$$1. \frac{12m^2 n^5}{+5} \div \frac{3m^2 n}{m^2-25} = \frac{\cancel{2}^2 \cancel{2}^2 \cancel{3}^1}{\cancel{m}^2 \cancel{5}^1} \cdot \frac{\cancel{(m+5)}^1 \cancel{(m-5)}^1}{\cancel{1}^1 \cancel{m}^1} = \frac{4n^4(m-5)}{m}$$

$$2. \frac{n^2-9}{6m^2 n^2} \div \frac{5n-20}{10m^2} = \frac{\cancel{3}^1 \cancel{3}^1}{\cancel{2}^1 \cancel{3}^1} \cdot \frac{\cancel{(n-3)}^1 \cancel{(n+3)}^1}{\cancel{5}^1 \cancel{2}^1} = \frac{10m^2}{5(2m^2)} \cdot \frac{(n-3)}{6m^2} = \frac{10 \div 5}{5 \div 5} \cdot \frac{2}{1} = 2 \cdot \frac{(n-3)}{6m^2} = \frac{1}{3m^2} (n-3)$$

$$3. \frac{m^2}{m^2-7m} \cdot \frac{1}{m^2+m+1} = \frac{m^2}{m(m-7)} \cdot \frac{(m-7)(m+3)}{1} = m(m+3)$$

$$4. \frac{16-2m}{m^2+2m-24} \div \frac{m-8}{3m+18} = \frac{-2(\cancel{m-8})}{(m+6)(m-4)} \cdot \frac{3(\cancel{m+6})}{(\cancel{m+6})} = \frac{-6}{m-4}$$

$$5. \frac{12n-36}{9-n^2} \div \frac{8n^5}{n^2+3n} = \frac{\cancel{3}^1 \cancel{(n-3)}^1}{-1(\cancel{n+3}) \cancel{(n-3)}} \cdot \frac{1(\cancel{n+3})}{\cancel{8}^2 \cancel{n}^2} = -\frac{3}{2} n^4$$

$$6. \frac{m^2-n^2}{m^2+2mn+n^2} \div \frac{m^2n-mn^2}{7m^2} = \frac{\cancel{(m+n)} \cancel{(m-n)}}{\cancel{(m+n)} \cancel{(m+n)}} \cdot \frac{7\cancel{m}^1 n^2}{\cancel{m}^1 \cancel{n} \cancel{(m-n)}} = \frac{7m}{n(m+n)}$$

$$7. \frac{n^2-n-12}{2n^2-15n+18} \div \frac{3n^2-12n}{2n^2-9n^2} = \frac{\cancel{(n-4)}^1 (n+3)}{(2n-3)(n-6)} \cdot \frac{n^2(2n-9)}{3n(2n-9)} = \frac{n(2n-9)(n+3)}{3(2n-3)(n-6)}$$

$$8. \frac{17mn^3}{m^2+2m-35} \div \frac{34m^5 n^4}{m^2+7m} = \frac{\cancel{17}^1 \cancel{m}^1 \cancel{n}^3}{\cancel{(m+7)}^1 \cancel{(m-5)}^1} \cdot \frac{1(\cancel{m+7})}{\cancel{34}^2 \cancel{m}^4 \cancel{n}^4} = \frac{1}{2m^6 n(m-5)}$$

$$9. \frac{4n^3-25n}{3n^2-6n+5} \div 10n+25 = \frac{\cancel{n}^1 \cancel{(2n+5)}^1 \cancel{(2n-5)}^1}{(3n-1)(n-5)} \cdot \frac{1}{5(\cancel{2n+5})} = \frac{n(2n-5)}{5(3n-1)(n-5)}$$

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